

Team 8: Plastic waste reduction and reuse

It takes 1,000 years for a plastic bag to degrade in a landfill, and it does not break down completely but instead becomes micro plastics that pollute the environment. Plastic is widely used all over the world and at times irreplaceable. Many industries, including the tech industry has been actively looking for a way to reduce plastic usage in the recent years. SME has been keen on reducing the environmental impact from plastic parts usage while maintaining efficiency. SME suggests to use machine learning processes to optimizing energy consumptions and reducing incorrectly produced plastic parts used in SMEs in processing. Author Martina Willenbacher claimed "Machine data were recorded in a plastics-producing company for the automotive industry and analyzed with regard to the material and energy flows. Machine learning methods were used to train these data to uncover optimization potential. Machine learning is suitable for this if sufficient training data are available" (1). By implementing machine learning into manufacturing plastic, it is possible to reduce the production of plastic by eliminating odds of over producing plastic parts and optimize the production. There are many ways to reduce plastic waste to minimize plastic pollutant emission, but in places where plastics are not substitutable, preventing incorrectly produced plastic parts through properly monitored manufacturing with the help of machine learning seems very promising.

- (1) Willenbacher Martina, Jonas Scholten, and Volker Wohlgemuth. "Machine Learning for Optimization of Energy and Plastic Consumption in the Production of Thermoplastic Parts in SME." *Sustainability* 13, no. 12 (2021): 6800. <https://doi.org/10.3390/su13126800>.